of the fluid from the fluid cavity into the needle, and the plunger operates to release the needle for retraction by the biasing element.

11. The device of claim 10 wherein the plunger profile is configured to form a fluid-tight seal with the interior contour of the fluid cavity.

12. The device of claim 10 wherein the plunger comprises an elastomeric ring-shaped seal.

13. The device of claim 10 wherein the biasing element is a coiled spring.

14. The device of claim 10 comprising a needle retainer for releasably retaining the needle in the projecting position.

15. The device of claim 14 wherein the needle retainer comprises a frangible connection, and forward displacement of the plunger operates to fracture the frangible connection to effectuate release of the needle.

16. The device of claim 10 wherein the plunger comprises a cavity for receiving the needle after retraction.

17. The device of claim 10 comprising a hub connected with the needle during retraction, wherein the biasing element biases the needle hub rearwardly.

18. A medical device, comprising:

a needle having a rearward end and a forward end forming a sharpened tip, operable between a projecting position in which the sharpened tip is operable to pierce the skin of a patient, and a retracted position in which the sharpened tip is shielded against inadvertent contact;

a housing having a fluid cavity with an interior contour;

a fluid contained in the fluid cavity in fluid communication with the needle;

a plunger axially displaceable within the housing and operable to expel fluid from the fluid cavity;

a profile on the forward end of the plunger configured to conform with the interior contour of the fluid cavity;

a locking mechanism configured to lock in the plunger in the housing; and

a biasing element for displacing the needle from the projecting position to the retracted position;

wherein upon forward displacement of the plunger, the plunger profile engages the interior contour of the fluid cavity to expel substantially all of the fluid from the fluid cavity into the needle, after which further displacement of the plunger releases the needle to the retracted position and engages the locking mechanism.

19. The device of claim 18 wherein the locking mechanism comprises an interior annular groove in the housing and a circumferential rib on the plunger configured to engage the groove as the plunger is displaced forwardly into the housing to substantially prevent further axial displacement of the plunger.

20. The device of claim 18 wherein the locking mechanism comprises:

a resilient tab extending radially outwardly from the plunger; and

an annular lip extending radially inwardly in the housing;

wherein the resilient tab is configured to engage the annular lip during forward displacement of the plunger and deflect radially inwardly to facilitate passage of the resilient tab into the housing, after which the resilient tab retracts radially outwardly in coaxial alignment with the annular lip, such that rearward displacement of the plunger out of the housing is substantially prevented.

21. The device of claim 18 comprising a flange on the rearward end of the plunger operable to axially displace the plunger within the housing.

22. The device of claim 21 comprising a recess in the rearward end of the

housing adapted to receive the flange in a recessed position after the locking mechanism is engaged.

23. The device of claim 18 wherein the plunger comprises an elastomeric ring-shaped seal.

24. The device of claim 18 wherein the biasing element is a coiled spring.

25. The device of claim 18 wherein the plunger comprises a cavity for receiving the needle after retraction.

26. The device of claim 18 comprising a hub connected with the needle during retraction, wherein the biasing element biases the needle hub rearwardly.

27. A medical device, comprising:

a needle having a rearward end and a forward end forming a sharpened tip, operable between a projecting position in which the sharpened tip is operable to pierce the skin of a patient, and a retracted position in which the sharpened tip is shielded against inadvertent contact;

a housing containing a fluid in fluid communication with the needle;

a plunger axially displaceable within the housing and operable to expel fluid from the fluid cavity;

a flange on the rearward end of the plunger operable to axially advance the plunger;

a biasing element for displacing the needle from the projecting position to the retracted position;

a locking mechanism configured to lock the plunger in the housing; and

a recess in the rearward end of the housing adapted to receive the flange in a recessed position when the plunger is locked within the housing;

wherein the plunger is axially displaceable to expel fluid from the fluid cavity

through the needle and further axially displaceable to release the needle to the retracted position, said plunger being axially displaceable until the flange fully enters the recess on the housing, at which time the plunger is locked within the housing.

28. The device of claim 27 wherein the locking mechanism comprises an interior annular groove in the housing and a circumferential rib on the plunger configured to engage the groove as the plunger is displaced forwardly into the housing to substantially prevent further axial displacement of the plunger.

29. The device of claim 27 wherein the locking mechanism comprises:

a resilient tab extending radially outwardly from the plunger; and

an annular lip extending radially inwardly in the housing;

wherein the resilient tab is configured to engage the annular lip during forward displacement of the plunger and deflect radially inwardly to facilitate passage of the resilient tab into the housing, after which the resilient tab retracts radially outwardly in coaxial alignment with the annular lip, such that rearward displacement of the plunger out of the housing is substantially prevented.

30. The device of claim 27 wherein the device comprises a needle retainer releasably retaining the needle in the projecting position.

31. The device of claim 30 wherein the needle retainer comprises a frangible connection, and forward displacement of the plunger operates to fracture the frangible connection to effectuate release of the needle.

32. The device of claim 27 wherein the plunger comprises an elastomeric ring-shaped seal.

33. The device of claim 27 wherein the biasing element is a coiled spring.

34. The device of claim 27 wherein the plunger comprises a cavity for receiving the needle after retraction.

35. The device of claim 27 comprising a hub connected with the needle during retraction, wherein the biasing element biases the needle hub rearwardly.

36. A medical device, comprising:

a needle having a rearward end and a forward end forming a sharpened tip, operable between a projecting position in which the sharpened tip is operable to pierce the skin of a patient, and a retracted position in which the sharpened tip is shielded against inadvertent contact;

a housing having a fluid cavity containing a fluid in fluid communication with the needle;

a plunger axially displaceable within the housing and operable to expel fluid from the fluid cavity;

a biasing element for displacing the needle from the projecting position to the retracted position; and

a needle retainer for releasably retaining the needle in the projecting position;

wherein upon forward displacement of the plunger, fluid is expelled from the fluid cavity into the needle, and further forward displacement of the plunger causes the frangible needle retainer to release the needle for retraction by the biasing element.

37. The device of claim 36 wherein the needle retainer comprises a frangible connection, and forward displacement of the plunger operates to fracture the frangible connection to effectuate release of the needle.

38. The device of claim 36 wherein the plunger comprises an elastomeric ring-shaped seal.

39. The device of claim 36 wherein the biasing element is a coiled spring.

40. The device of claim 36 wherein the plunger comprises a cavity for receiving the needle after retraction.

41. The device of claim 36 comprising a hub connected with the needle during retraction, wherein the biasing element biases the needle hub rearwardly.

42. The device of claim 36 comprising a locking mechanism configured to lock the plunger in the housing.

43. The device of claim 42 wherein the locking mechanism comprises an interior annular groove in the housing and a circumferential rib on the plunger configured to engage the groove as the plunger is displaced forwardly into the housing to substantially prevent further axial displacement of the plunger.

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44. The device of claim 42 wherein the locking mechanism comprises:

a resilient tab extending radially outwardly from the plunger; and

an annular lip extending radially inwardly in the housing;

wherein the resilient tab is configured to engage the annular lip during forward displacement of the plunger and deflect radially inwardly to facilitate passage of the resilient tab into the housing, after which the resilient tab retracts radially outwardly in coaxial alignment with the annular lip, such that rearward displacement of the plunger out of the housing is substantially prevented.

REMARKS

In the Official Action dated July 9, 2001, the Examiner rejected Applicant's claims 1-7 as being anticipated by Ridderheim et al U.S. Patent No. 4,995,870 ('870 patent), Villen Pascual U.S. Patent No. 5,049,133 ('133 patent) and Gaarde U.S. Patent No. 5,064,419 ('419 patent). There were no prior art rejections of claims 8 and 9. However, claims 8 and 9 were rejected under statutory double patenting. Applicants request that the Examiner reconsider the rejection of claim 1 - 9 in light of